

Lecithoceridae (Lepidoptera) of Taiwan (V): Subfamily Torodorinae: *Thubana* Walker, *Athymoris* Meyrick, *Halolaguna* Gozmany, and *Philharmonia* Meyrick

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Abstract Eleven species belonging to *Thubana*, *Halolaguna*, *Athymoris*, and *Philharmonia* of Torodorinae are recognized from Taiwan. Among them, five species are described as new to science: *Athymoris aurantiella* sp. nov., *A. liukueiensis* sp. nov., *A. subtrigona* sp. nov., *Halolaguna palinensis* sp. nov., and *Philharmonia adusta* sp. nov.. Four species, *Athymoris phreatosa* (Wu), *A. paramecola* (Wu), *Halolaguna oncopteryx* (Wu), and *Halolaguna subluxata* Gozmany are reported for the first time from Taiwan. The genus *Cubitomoris* Gozmany is synonymized with *Athymoris* Meyrick. New combinations, *Halolaguna oncopteryx* (Wu, 1994), **comb. nov.** and *Athymoris aechmobola* Meyrick, **comb. nov.** are given.

Key words Systematics, Lepidoptera, Lecithoceridae, Taiwan

INTRODUCTION

This article is the 5th part of a series of taxonomic studies of the Lecithoceridae in Taiwan. The first (Park, 1999a) and the 2nd part (Park, 2000a) dealt with the subfamily Lecithocerinae, and the 3rd with the genus *Torodora* Walker (Park, 2000b) and the 4th with the genus *Deltoplasris* Meyrick belonging to the subfamily Torodorinae (Park, 2000c). The material examined for this study was largely based on the collections in the Smithsonian Institution, US National Museum of Natural History (USNM), Washington D.C. and the Florida State Collection of Arthropods (FSCA), Gainesville, Florida, USA; Taiwan Forestry Research Institute (TFRC), Taipei, Taiwan, and on the author's recent collecting (1996, 1997) from Taiwan. Original references for the previously known genera and species are cited with their abbreviations, sources of types and type specimens are provided, and type localities for the valid or invalid species are indicated in square brackets. Collecting localities are cited as same as in the specimen's labels, but some old invalid names are indicated with present ones in the parenthesis.

Abbreviations for depositories of material, including above two museums, are as follows: The Hungarian Museum of Natural History (HMNH), Budapest, Hungary; the Institute of Zoology, Academia Sinica (IZAS), Beijing, China; Museum de Istorie Naturala "Grigore Antipa" (MINGA), Bucharest, Rumania; Center for Insect Systematics (CIS), Kangwon National University, Chunchon, Korea. Types which indicated as "to CIS on indefinite loan from Taiwan" will be placed in the National Taiwan Museum or another institute in Taiwan with a further discussion of the authority in the future.

SYSTEMATICS

***Thubana* Walker, 1864**

Thubana Walker, 1864, List Spec. lepid. Insects Colln. Br. Mus. 29: 814. Type: *Tubana bisignatella* Walker, 1864 [Sarawak].

= *Titana* Walker, 1864, List Spec. lepid. Insects Colln. Br. Mus. 29: 813 [Sarawak].

= *Tiva* Walker, 1864, List Spec. lepid. Insects Colln. Br. Mus. 29: 821 [Sarawak].

= *Inapha* Walker, 1864, List Spec. lepid. Insects Colln. Br. Mus. 30: 999 [Sarawak].

= *Stelechoris* Meyrick, 1925, [in] Wytzman, Genera Insectorum 184: 243 [Sri-Lanka].

Forewing relatively long, costa gently curved, apex more or less sharpened, termen strongly sinuate; R_4 and R_5 coincident, M_1 arising from upper angle of cell, almost connate with stalk of R_{3+4+5} , M_1 and M_2 free, CuA_1 and CuA_2 stalked; cell closed. Hindwing broader than forewing; M_2 almost parallel to M_3 , M_2 and CuA_1 stalked. Distributional range of the genus includes Nepal, Assam, China, and Taiwan. Among less than ten known species of the world, *T. albisignis* Meyrick and *T. deltaspis* Meyrick were described from Taiwan. The genus *Stelechoris* Meyrick was synonymized with this genus by Gozmany (1978), based on the similarity of venation, but the male genitalia has a very characteristic shape, similar to those of *Halolaguna* Gozmany

***Thubana deltaspis* Meyrick, 1935**

(Figs 1, 12, 12a, 22, 22a)

Thubana deltaspis Meyrick, 1935, Exot. Microlep. 4: 563; Gaede, 1937: 513; Clarke, 1965: 228, 4. 114, f. 2; Gozmany, 1978: 236, t. 15, f. 159. Type, ♂, Sozan, Formosa, BMNH-8827/Clarke, Coll. BM.

Diagnosis. Wingspan, 20–24 mm. The species has a distinct white costal patch in the forewing. The wing patch is similar to that of *T. microcera* Gozmany which was described from China, but it can be easily distinguished by its light brown head, whereas ochreous white in the latter. This is one of the

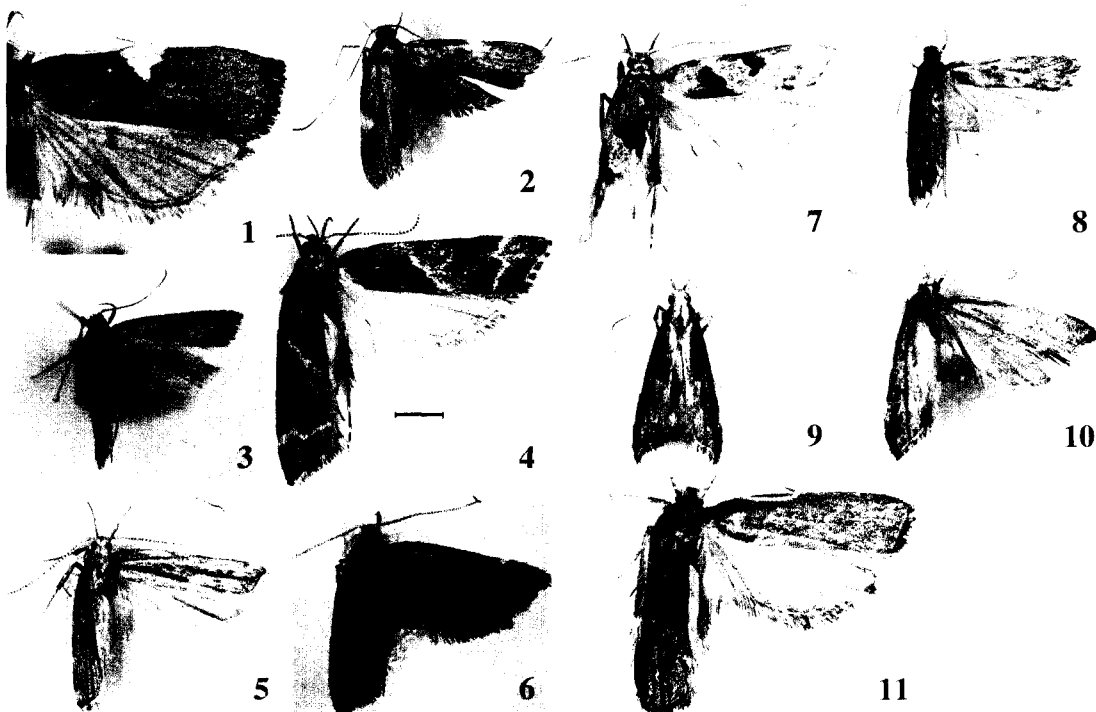
common species in Taiwan. The female is known for the first time.

Male genitalia (Figs 12, 12a). See Clarke (1965, pl. 114, fig. 2a-b) and Gozmany (1978, pl. 52, fig. 159).

Female genitalia (Figs 22, 22a). The female genitalia is described and illustrated for the first time. Ostium broad but very short, weakly sclerotized, emarginated at middle on anterior margin. Ductus bursae broadened in conjunction with ostium, then narrowed coiling 2-3 times; ductus seminalis arising from near distal 1/3. Corpus bursae extremely large, ovate; signum trapezoidal with groove centrally.

Materials examined. 1 ♂, Sozan, 25 IV 1935 (S Issiki), gen. slide no. USNM-11686/Hodges; 1 ♀, Taiheisan, 10 V 1942 (S Issiki), gen. slide no. USNM-11687/Hodges-USNM; 1 ♂, Lienhauachi Exp. For. Stn., 750 m, 15 km SW Puli, Nantou Co. (JB Heppner and H Wang; 1 ♀, Liukuei For. Stn., Kaohsiung Co., 29 IV-3 V 1989 (JB Heppner and H Wang)-FSCA; 1 ♂, Ming-Chr, 1,160 m, Ilan Co., 9-10 VII 1996 (KT Park and HK Lee)-CIS.

Distribution. Taiwan, China (Fujian).



Figs 1-11. Adults: 1, *Thubana deltaspis* Meyrick; 2, *Thubana albisignis* (Meyrick); 3, *Athymoris martialis* Meyrick; 4, *A. aurantiella* sp. nov.; 5, *A. liukueiensis* sp. nov.; 6, *Athymoris phreatosa* (Wu); 7, *A. subtrigona* sp. nov.; 8, *Halolaguna sublaxata* Gozmany; 9, *H. oncopteryx* (Wu); 10, *H. palinensis* sp. nov.; 11, *Philharmonia adusta* sp. nov..

***Thubana albisignis* (Meyrick, 1914)**

(Figs 2, 13, 13a, 13b)

Lecithocera albisignis Meyrick, 1914, Suppl. Ent. 3: 50; Meyrick, 1925: 235; Gaede, 1937: 513.
 Gozmany, 1978: 234, t. 15, f. 156. Type, ♀, Kosempo, Formosa, 4350/Gozmany, Coll. DEOI.

Diagnosis. Wingspan, 15–16 mm. This species is much smaller than the preceding species and has a more or less triangular whitish costal patch medially. It is also very similar to *T. leucosphena* Meyrick described from China, but the latter is larger, with forewing length about 19 mm. A male specimen was found for the first time.

Male genitalia (Figs 13, 13a, 13b). Male genitalia is described and illustrated for the first time. Uncus usual. Gnathos with upper lobes at base of hooks. Tegumen with long setae laterodistally. Costal margin of valva curved inwardly, angled at basal 3/5. Juxta U-shaped distally with lateral lobes; apex of lobe acute. Aedeagus with 2–3 dentates near apex.

Female genitalia. See Gozmany (1978, pl. 87, fig. 156).

Materials examined. 1 ♂, Shanpin For. Stn., 750 m, Liukuei 10 km SE, Kashiung Co. (KT Park et HK Lee), gen. slide no. 4268/Park–CIS; 1 ♂, ?, Pingtung Co., 22–25 VII 1980 (D Davis)–this specimen was examined by Dr. CS Wu in Beijing (pers. comm.).

Distribution. Taiwan (endemic).

Remarks. Wu (pers. comm.) provided his result of the examination of a Taiwanese male specimens. The author also examined a male and identified it as *T. albisignis* Meyrick by the external appearance.

***Athymoris* Meyrick, 1935**

Athymoris Meyrick, 1995, Exot. Microlep. 4: 564. Type: *A. martialis* Meyrick, 1935 [Formosa].

Cubitomoris Gozmany, 1978, Microlep. Palaearctica 5: 239. Type: *Lecithocera aechmobola* Meyrick, 1935 [China], **syn. nov.**

The genus was described, as a monotypy, on the basis of *A. martialis* Meyrick from Taiwan. Forewing is elongate, relatively narrow, and venation is similar to that of *Torodora*, but is differentiated by M_{2-3} coincident and cell opened. Abdominal tergites have zone of spines. Gozmany (1978) erected a new genus *Cubitomoris*, separating from this genus by the difference of forewing venation, especially in CuA_1 and CuA_2 that are free, not stalked. However, the differences are considered not enough to separate them, because such infraspecific variations are frequently observed in this family (Park, 1999a: 242), and the male genitalia of *aechmobola* Meyrick, type species of *Cubitomoris*, is much related to this genus. Thus, I propose to treat *Cubitomoris* Gozmany as a junior synonym of *Athymoris*: *A. aechmobola* Meyrick, **comb. nov.**

***Athymoris martialis* Meyrick, 1935**

(Figs 3, 14, 14a, 23)

Athymoris martialis Meyrick, 1935, Exot. Microlep. 4: 564; Clarke, 1965: 8, t. 4, f. 1; Gozmany, 1978: 241. Type: ♂, Mt. Pinansyusan, Formosa, BMNH-8903/Clarke, Coll. BM.

Diagnosis. Externally it is very close to *Halolaguna subluxata*, but it can be separated by stalked CuA₁ and CuA₂ in forewing, and the different shape of the male genitalia.

Male genitalia (Figs 14, 14a). See Clarke (1965, pl. 4, fig. 1a) and Gozmany (1978, pl. 53, fig. 163).

Female genitalia (Fig. 23). Female genitalia is described and illustrated for the first time. Distal margin of 8th sternite broadly emarginate, densely setose. Ostium membranous. Ductus bursae short, broadly connected to corpus bursae; ductus seminalis arising from near conjunction, extremely broad at base, narrowed medially, and forming a pear-shaped sac; secondary seminalis arising from the sac.

Materials examined. 1 ♂, Liukuei For. Stn., 750 m, Kaohsiung Co., 16–23 III 1990 (JB Heppner and H Wang), gen. slide no. 4108; 1 ♂, 2 ♀, same data, 29 IV–3 V 1989 (JB Heppner and H Wang), gen. slide no. 4128 and 4129; 2 ♀, Kenting Park, 255 m, 23–28 IV. 1989 (JB Heppner and H Wang), gen. slide no. 4130; 1 ♂, Kenting Park, Pintung Co., 9–15 III 1990 (JB Heppner); 1 ♂, 1 ♀, Shanpin For. Stn, Liukuei 10 km SE, Kaohsiung Co., 5–6 VII 1996 (KT Park and HK Lee); 1 ♂, Upper palin, 2,260 m, Ilan Co., 11–12 VII 1996 (KT Park and JS Lee).

Distribution. Taiwan (new record), China, Japan, and Korea.

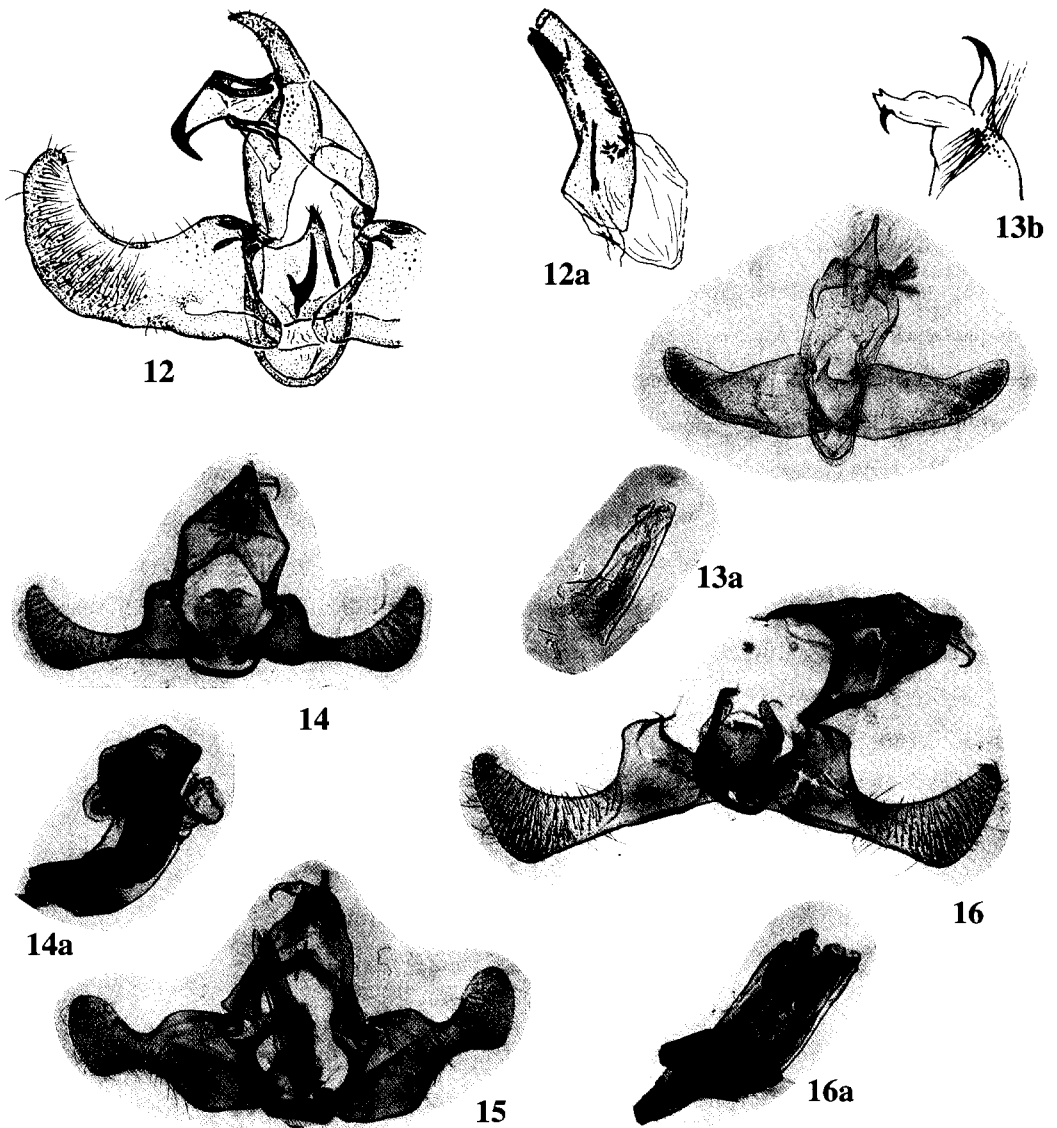
***Athymoris aurantiella* sp. nov.**

(Figs 4, 15, 15a, 25)

Diagnosis. Externally this species differs from any known species of the genus by the clearly developed whitish yellow median line arising from under basal 1/3 of costa to middle of dorsum.

Description. Wingspan, 16.0–18.0 mm. Head yellowish orange. Thorax and tegula dark brown, speckled with yellowish orange scales. Antenna about 5/6 of forewing length; scape relatively short; flagellum with distinct dark-brown annulations, ciliated by very fine hairs. Second segment of labial palpus slightly thickened, dark brown outwardly, with ochreous apex; 3rd as long as 2nd, ochreous with irregular dark scales. Forewing ground colour yellowish white, with irregular markings and patterns throughout; postmedian line distinct, slightly serrate, strongly curved at M₁ vein outwardly; apex more or less acute; termen sinuate; cell open. Hindwing grey, with relatively obtuse apex; cell open; termen oblique; M₂ running close and almost parallel to M₃.

Male genitalia (Figs 15, 15a). Similar to those of *Deltoplastis commatopa* Meyrick in general



Figs 12-16. Male genitalia (a: aedeagus, b: uncus and gnathos): 12, *Thubana deltaspis* Meyrick; 13, *Thubana albisignis* (Meyrick); 14, *Athymoris martialis* Meyrick; 15, *A. aurantiella* sp. nov.; 16, *A. liukueiensis* sp. nov..

appearance: distal part of valva form in triangle, shorter than that of the latter; ventral margin almost straight without emargination medially. Juxta with well developed lateral lobes. Aedeagus stout, as long as valva.

Female genitalia (Fig. 25). Distal margin of 8th sternite broadly emarginated medially. Apophyses anteriores about half of posteriores in length. Ostium with sword-shaped, sclerotized lateral plates.

Ductus bursae shorter than length of corpus bursae; signum small, lunular.

Type: Holotype: male, Kuangwu For. Stn., 2,000 m, Hsinchu Co., 18–25 Aug. 1988 (JB Heppner and H Wang), gen. slide no. 4104/Park. Paratypes: 1 ♀, same locality, 24–25 June 1985 (JB Heppner and H Wang), gen. slide no. 4501/Park; 1 ♂, Anmah-shan, 2,250 m, 29–30 Aug. 1988 (JB Heppner and H Wang)–FSCA; 1 ♂, Hassenzan (= Pahsienshan), Taichung Co., 6 June 1942 (S Issiki), USNM; 9 ♂ ♀, Tien-Chi, 2260m, Kaohsiung Co., 7 July 1996 (KT Park and JS Lee); 2 ♀, Kukuyuan, 2,420 m, Hohuan Mt. Hotel, Hualien Co., 3 July 1996 (KT Park); 1 ♂, Ming-Chr, 1,160 m, Ilan Co., 9–10 July 1996 (KT Park et JS Lee)–CIS. Holotype to FSCA on definite loan from Taiwan.

Distribution. Taiwan.

Etymology. The name is derived from the Latin, “auranti”, corresponding to the colour of the yellowish orange of head and wings.

***Athymoris liukueiensis* sp. nov.**

(Figs 5, 16, 16a, 24)

Diagnosis. Externally this new species is hardly distinguishable from *aechmobola* (Meyrick), which was described from West Tienmushan, China, except its slightly larger size. Cuculus of the male genitalia is much shorter than that of the latter, and this can be a good separable character from *aechmobola* Meyrick. Sometimes this kind of differences in the genital feature is due to the position of the material laid on a slide, or due to different ways of dissecting procedures, but the difference referred here is obvious in every specimen of *aechmobola* (Meyrick) I compared: the male lectotype in BM, a paralectotype in “Grigore Antipa” Museum of Natural History, Buccarest, and a specimen in the Hungarian Natural History Museum.

Description. Male and female. Wingspan, 18–19 mm. Head yellowish white. Tegula light brown. Antenna longer than forewing length; scape relatively short; flagellum ciliate with very fine hair-like scales, with dark brown annulations. Second segment of labial palpus heavily thickened, porrect, dark brown on outer surface, light grey but lower half dark grey on inner surface; 3rd segment strongly upturned, almost right angle, as long as 2nd. Forewing ground colour ochreous white, with dark streaks running along cell and veins irregularly, with a large dark-brown spot at end of cell; dark-brown scales spread along inner margin of termen; costa almost straight beyond basal 1/5, a large ochreous patch before apex; apex obtuse; termen slightly oblique, almost straight; $R_3+R_4+R_5$ stalked, R_5 to termen, M_1 remote from R_{3+4+5} at base, M_{2+3} coincident, M_2 far from CuA_1 and running along middle beyond cell, CuA_1 and CuA_2 separate; cell open. Hindwing with M_2 present, M_3 and CuA_1 stalked beyond middle; no cubital pecten. Hindtibia with setiform scales above and below. Abdominal tergites with zones of dense

spines.

Male genitalia (Figs 17, 17a). Uncus slender. Gnathos relatively small and short. Valva broad basally, costa strongly emarginated from half, forming a narrow neck; cucullus spatulate, short, expanded vertically, whereas elongated more or less longitudinally in *aechmobola* Meyrick. Juxta simple. Vinculum with lobes curved inwardly at apex. Aedeagus slender without cornutus.

Female genitalia (Fig. 24). Apophysis anterioris about 2/3 of apophysis posterioris. Eighth sternite emarginated at middle on distal margin. Ostium weakly sclerotized. Ductus bursae long, coiled 2–3 times. Corpus bursae, ovate, with hexagonal signum.

Type. Holotype: male, Liukuei For. Stn. 750 m, Kaohsiung Co., 29 IV–3 V 1989 (JB Heppner and H Wang), gen. slide no. 4097/Park. Paratypes: 1 ♀, same data as holotype, gen. slide no. 4501/Park; 1 ♀, Chingshan, 1,100 m, Taichung Co., 31 VIII–4 IX 1988 (JB Heppner and H Wang); 8 ♂ ♀, Shampen For. Stn., 750 m, Liukuei 10 km SE, Kaohsiung Co., 5–6 VII 1996 (KT Park). Holotype to FSCA on definite loan from Taiwan, and paratypes in FSCA and CIS.

Distribution. Taiwan.

Remarks. Compared with the lectotype of *aechmobola* Meyrick (♂, Tienmushan, China, c. 5,000, 8. [19]32" slide no. 8867/Clarke in BM, forewings partly damaged, and a paralectotype, West Tienmushan (1,600 m), Pz. Chekiang, 31. 8. [19] 32 (H. Höne), in MINGA, Bucarest, and also with both sexes of adults and the genitalia of *aechmobola* Meyrick from the type locality: 1 ♂, Tienmushan, 9 Sept. 1932 (H. Höne)–4314/Gozman; 1 ♀, ditto, 10. 9. 1932 (H. Höne)–4316/Gozman in HNHM, Budapest.

Etymology. The specific name is derived from the type locality, Liukuei, Taiwan.

***Athymoris phreatosa* (Wu, 1994)**

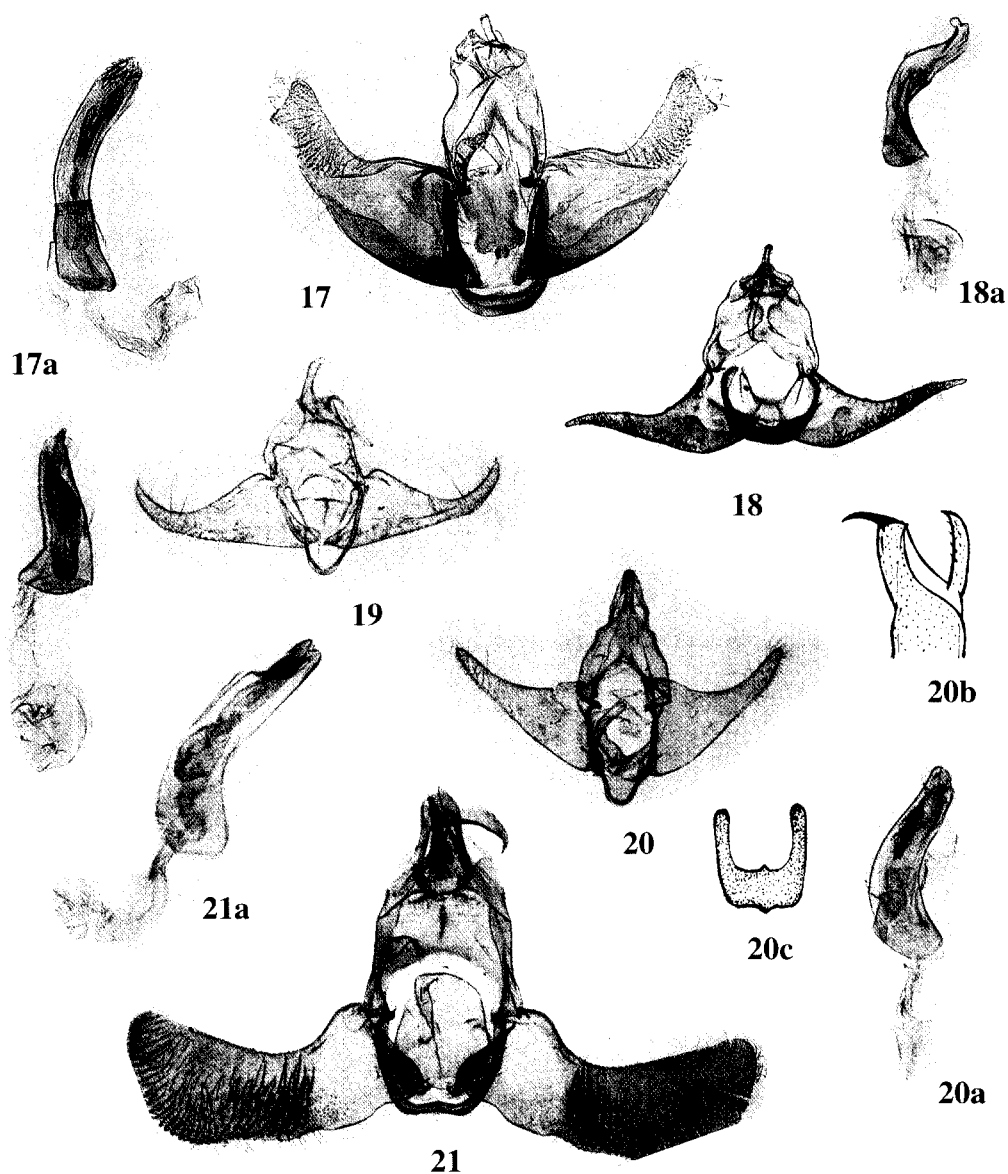
(Figs 6, 27)

Cubitomoris phreatosa Wu, 1997, Lepidoptera Lecithoceridae, Fauna Sinica, Insecta vol. 7: 93. Type: holotype, Qingcheng Mt. Sichuan Prov. 25 VII 1980 (Bai Jiuwei).

Diagnosis. Wingspan, 17 mm. This species differs from allies of the genus by its dark-brown ground colour and a white spot at costal 2/3 in the forewing., and signum with a medial groove in the female genitalia.

Female genitalia (Fig. 27). Distal margin of 8th sternite deeply emarginated at middle. Ostium bursae broad, cup-shaped. Ductus bursae long, about 1.5 times longer than corpus bursae, with 6–7 strong spines near middle; ductus seminalis arising from distal 1/4. Signum almost hexagonal, with a groove at centrally.

Materials examined. 1 ♀, Upper Palin, Ilan Co., 11–12 VII 1996 (KT Park and HK Lee), gen. slide



Figs 17-21. Male genitalia (a: aedeagus, b: uncus and gnathos, c: juxta): 17, *Athymoris subtrigona* sp. nov.; 18, *Halolaguna subluxata* Gozmany; 19, *H. oncopteryx* (Wu); 20, *H. palinensis* sp. nov.; 21, *Philharmonia adusta* sp. nov..

no. 4506/Park.

Distribution. Taiwan (new record), and China (Sichuan).

Remarks. This species was described, based on a female from China. No male has been found yet.

***Athymoris subtrigona* sp. nov**

(Figs 7, 17, 17a, 26)

Diagnosis. The shape and pattern of the forewing is rather similar to those of *Deltoplastis*, but the wing venation differs from the latter by M_2 present in hindwing. The male genitalic characters somewhat differs from those of the type species, *martialis* Meyrick. I placed tentatively this species in *Athymoris*.

Description. Male and female. Wingspan, 16–17 mm. Head shiny ochreous white from gena to vertex. Tegula and thorax concolorous, but tegula with dark brown scales anteriorly. Antenna with scape relatively expanded, almost equal to wing in length. Labial palpus strongly upturned; 2nd joint slender, with appressed scales ventrally, dark brown on outer surface, apical portion yellowish white; 3rd segment slender, as long as 2nd, orange brown outwardly. Forewing relatively narrow, almost parallel, with a distinct dark-brown subbasal fascia; median fascia large, triangular, its apex reaching to stalk of vein-R; discal patch mushroom-like, edging with fuscous costal patch; postmedian line narrow, yellowish white, strongly curved outwardly on stalk of R_{4+5} , slightly serrated; venation with $R_3+R_4+R_5$ stalked, M_2+M_3 coincident M_3 stalked with stem of CuA_1 and CuA_2 , CuA_1 and CuA_2 shortly stalked; cell partially closed; cilia pale grey. Hindwing pale grey; apex obtuse, termen strongly emarginated below apex; venation with M_2 present, M_3 and CuA_1 short-stalked; cell open.

Male genitalia (Figs 17, 17a). Uncus relatively short, small, almost parallel-sided, with round apex. Gnathos also small. Valva broad at basal half; cucullus armed with many setae; outer margin incurved, sharply angled at lower corner; sacculus sclerotized, extended to 2/3 on ventral margin. Juxta with long lateral lobes distally, convex at middle on anterior margin. Aedeagus as long as valva; with more than 15 annular setae near apex and two rows of denticles.

Female genitalia (Fig. 26). Distal margin of 8th sternite emarginated at middle. Ostium broad, weakly sclerotized. Ductus bursae short, with numerous fine denticles in conjunction with corpus bursae; ductus seminalis arising from before conjunction. Corpus bursae membranous; no signum.

Types. Holotype: male, Fushan For. Stn., Ilan Co., 650 m, Taiwan, 4–11 IV 1990 (JB Heppner), gen. slide no. 4103/Park. Paratype: 1 ♀, same data as holotype; 1 ♀, Lushan, ca. 300 m, Nantou Co., Taiwan, 27–31 V 1990 (JB Heppner), gen. slide no. 4503/Park; 4 ♂, 1 ♀, Tungpu 1,150 m, Nantou Co., 1 VII 1985 (JB Heppner and H Wang); 4 ♂, 1 ♀, Chingshan, 1,100 m, Taichung Co., 31 VIII–1 IX 1980 (JB Heppner); 1 ♂, Kuangwu. For. Stn. Hsingchu Co., 18–25 VIII 1985 (JB Heppner and H Wang); 1 ♂, 1 ♀, same locality, 8–11 V 1989 (JB Heppner and H Wang); 18 ♂, ♀, Liukuei, Shanpin For., 750 m, Kaohsiung Co., 16–23 III 1990 (JB Heppner and H Wang)–FSCA. 1 ♂, Shanpin For Stn, 750 m, Liukuei, Kaohsiung Co., 5–6 VII 1996 (KT Park and HK Lee); 1 ♂, Wulai 550 m, Ta'pei Co., 1–2 VII 1996 (KT Park and HK Lee); 1 ♂, Ming-Chr 1,160 m, Ilan Co., 9–10 VI 1996 (KT Park and

HK Lee); 1 ♂, 1 ♀, Upper plain 2,260 m, Ilan Co., 11–12 VII 1996 (KT Park and JS Lee); 1 ♂, 1 ♀, Tayuling 2650 m, Nantou Co., 3 VII 1996 (KT Park and HK Lee); 2 ♂, Lienhuachih For. Res. Stn. 650 m, Nantou Co., 19–20 IX 1997 (KT Park)–Holotype to FSCA on definite loan from Taiwan, and paratypes in FSCA and CIS.

Distribution. Taiwan.

***Halolaguna* Gozmany, 1978**

Halolaguna Gozmany, 1978. Palaearctic Microlepid. 5: 238. Type: *Halolaguna subluxata* Gozmany, 1978 [China].

Forewing venation is very similar to that of *Athymoris*, but it differs from the latter with M_1 far from R_{3+4+5} ; CuA_1 and CuA_2 free or approximated, whereas in *Athymoris* M_1 approximated to R_{3+4+5} and CuA_1 and CuA_2 stalked. The male genitalia are remarkably differentiated by the characteristic shape of the valva which tapered to apex, with a pointed apex. The male genitalia are somewhat close to those of *Cynicostola* Meyrick, but the venation of this genus is different from the latter.

***Halolaguna subluxata* Gozmany, 1978**

(Figs 8, 18, 18a, 28)

Halolaguna subluxata Gozmany, 1978, Palaearctic Microlepid. 5: 238. Type: ♂, Kiangsu, China, 3753/Gozmany, HNMH.

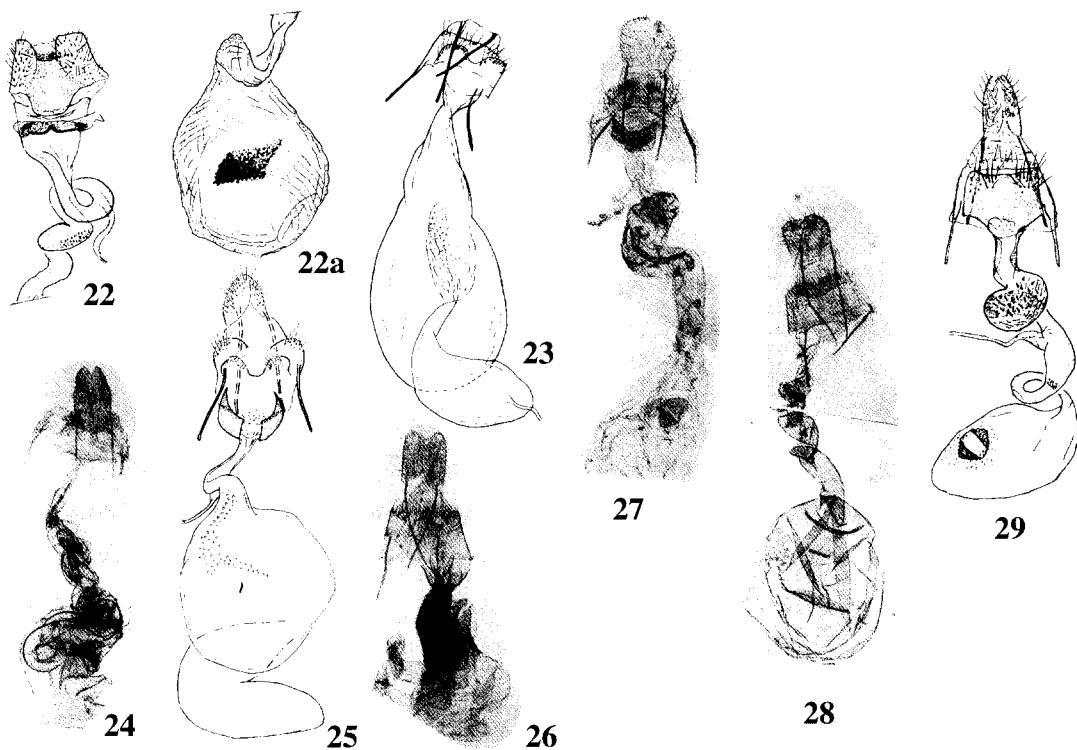
Diagnosis. Wingspan, 14–15 mm. *Thubana laxata* (Meyrick, 1911) from Assam, and *Stelechoris exaema* (Meyrick) from Sri-Lanka, are similar to this genus in the male genital characters, but differs in wing venation.

Male genitalia (Figs 18, 18a). See Gozmany (1978, pl. 53, fig. 161). Gnathos slender. Valva narrowed toward apex. Juxta U-shaped. Saccus broad. Aedeagus s-shaped.

Female genitalia (Fig. 28). Female genitalia is illustrated for the first time.

Apophysis anterioris about 3/5 of posterioris in length. Distal margin of 8th sternite slightly emarginated at middle, with densely setose. Ostium weakly sclerotized. Ductus bursae long, 3–4 times coiled. Corpus bursae relatively large, with 3 signa: caudal one long, crescent-shaped; middle one short, almost straight, and anterior one band-like, rod, straight.

Material examined. 1 ♂, Baibara, Taiwan, 24 III 1943 (S Issiki), gen. slide no. 4107/Park; 1 ♂, Taiheisan, 10 V 1942 (S Issiki), Issiki Coll. 1972–USNM. 1 ♂, 2 ♀, Chingshan, Taichung Co., 8–11 VI 1989 (JB Heppner and H Wang), gen. slide no. 4282/Park (♀); 1 ♂, Liukuei For. Stn. 750 m,



Figs 22-29. Female genitalia: 22, *Thubana deltaspsis* (Meyrick); 22a, ditto, corpus bursae; 23, *Athymoris martialis* Meyrick; 24, *A. liukueiensis* sp. nov.; 25, *A. aurantiella* sp. nov.; 26, *Athymoris subtrigona* sp. nov.; 27, *A. phreatosa* (Wu); 28, *Halolaguna subluxata* Gozmany; 29, *Philharmonia adusta* sp. nov..

Kaohsiung Co., 29 IV-3 V 1989 (JB Heppner and H Wang); 1 ♂, Fuyan, 400 m, Hualien Co., 7 III 1990 (JB Heppner and H Wang)-FCSA. 2 ♂, 2 ♀, Kukuan 720 m, Taroko Nat. Park, Taichung Co., 8 VII 1996 (KT Park and JS Lee); 1 ♂, Upper palin, 2260 m, Ilan Co., 11-12 VII 1996 (KT Park), gen. slide no. 4194/Park-CIS.

Distribution. China, Taiwan (new record), Korea.

Remark. The condition of the type specimen of *H. subluxata* Meyrick is bad: Both wings are missing.

***Halolaguna oncopteryx* (Wu, 1994), comb. nov.**

(Figs 9, 19, 19a)

Cynicostola oncopteryx Wu, 1994, Sinozoologia 11: 125; Wu, 1997: 107, fig. 7-7, 28-4.

Diagnosis. Wingspan, 15-16 mm.

Male genitalia (Figs 19, 19a). See also Wu (1997, pl. 7, f. 7). Uncus relatively strong. Valva very broad

at base, narrowed toward apex, with sharply pointed apex. Juxta with capitate lateral lobes. Aedeagus slightly shorter than valva, expanded basally; with stout, crescent-shaped cornutus, numerous spicules in vesica.

Material examined. 3 ♂, 2 ♀, Liukuei For. Stn, 750 m, Kaoshiung Co., 29 IV–3 V 1989 (JB Heppner and H Wang), gen. slide no. 4267, 4132/Park; 1 ♂, ♀, Kenting Park, Pingtung Co., 255 m, 23–28 IV 1989 (JB Heppner and H Wang), gen. slide no. 4131/Park.

Distribution. Taiwan (new record), China.

Remark. Wu (1994) placed this species in *Cynicostola*, considering its identity of the venation. However, the venation of this species is somewhat variable within species; one with M_{2+3} and CuA_1 stalked, the other with CuA_1 and CuA_2 stalked. This species does not have a brush-like tuft ventrally on the 2nd segment, whereas developed in *Cynicostola* Meyrick. The male genitalic character is certainly related to *Halolaguna*.

***Halolaguna palinensis* sp. nov.**

(Figs 10, 20, 20a, 20b, 20c)

Diagnosis. This species is similar to *H. oncopteryx* Wu in appearance, but it can be separated from the latter by its venation and male genitalia.

Description. Male. Wingspan 15 mm. Head creamy ochreous. Thorax brown, and tegula dark brown. Antenna ochreous throughout, shortly ciliate; pedicel rather long. Labial palpus strongly upturned; 2nd joint thickened with appressed scales ventrally, brown speckling with dark fuscous scales before 2/3 outwardly, beyond it paler towards apex, creamy ochreous on inner surface; 3rd as long as 2nd. Forewing relatively broad; ground colour greyish brown throughout, with dark brown discal dots, at 1/3 and near end; postmedian line indistinct, followed by darker area; pretornal patch dark brown; costa beyond 3/4 covered with dark brown scales; termen sinuate inwardly, followed by a yellowish line at base of cilia; cilia dark brown. Hindwing about equal to forewing in width. Ventral surface of fore- and mid-legs dark brown; hind tibia with short hair-like scales above, creamy ochreous ventrally.

Male genitalia (Figs 20, 20a, 20b, 20c). Uncus slightly dilated distally, with round apex. Gnathos relatively short. Valva extremely broad at base and tapering to apex; costal margin weakly incurved; ventral margin almost straight. Juxta U-shaped (fig. 20c). Saccus narrow. Aedeagus slightly longer than valva, weakly curved; cornutus forms a small plate with 3 denticles anteriorly; vesica with numerous fine spicules.

Type. Holotype: male, Upper plain 2,260 m, Ilan Co., 11–12 VII 1996 (KT Park), gen slide no. 4261. Holotype to CIS on definite loan from Taiwan.

Distribution. Taiwan

Etymology. The specific name is derived from the collecting locality of the holotype.

***Philharmonia* Gozmany, 1978**

Philharmonia Gozmany, 1978, *Microlep. Palaearctica* 5: 248. Type: *Philharmonia paratona* Gozmany, 1978.

This genus is closely related to *Epharmonia* Meyrick, but CuA₁ and CuA₂ are stalked. It was established as a monotypic genus based on *P. paratona* Gozmany, 1978, from China (Prov. Yunnan, Likiang), and recently Wu (1994) added *P. melona* Wu and *P. calipsa* Wu.

***Philharmonia adusta* sp. nov.**

(Figs 11, 21, 21a, 29)

Description. Male and female. Wingspan 14–16 mm. Head dark brown dorsally, ochreous white laterally. Tegula and thorax dark brown. Antenna ochreous throughout; lacking cilia; scape normal. Labial palpus strongly upturned; 2nd joint thickened with appressed scales ventrally, brown speckling with dark fuscous scales outwardly, paler towards apex; 3rd as long as 2nd. Forewing ground colour greyish brown throughout, sometimes with a yellowish white discal dot; postmedian line indistinct, originating from yellowish costal patch at 4/5; pretornal patch yellowish, distinct in male, but not present in female; termen followed by a yellowish line; cilia dark brown; venation with R₃, R₄₊₅ stalked, R₅ to apex, M₂ present, M₃ stalked with CuA₁ = 2; CuA₁ and CuA₂ relatively long-stalked; CuA₂ arising from lower angle of cell; cell open. Hindwing much broader than forewing; M₂ absent, M₂₊₃ and CuA₁ short-stalked; cell closed. Male with a long hair-pencil arising from metathorax laterally, longer than half of forewing. Ventral surface of legs dark brown; hind tibia with densely short hair-like scales above.

Male genitalia (Figs 21, 21a). Uncus relatively slender. Gnathos strong, relatively large. Valva similar to that of *Thubana*; base relatively broad; costal margin smoothly incurved; distal part slightly expanded, spatulate. Juxta with rounded distal margin, slightly emarginated on anterior margin; weakly sinuated on ventral margin. Aedeagus relatively narrow, about 1/2 of aedeagus in width, shorter than valva; vesica with fine numerous spicules.

Female genitalia (Fig. 29). Apophysis anterioris about half of apophysis posterioris in length. Distal margin of 8th sternite almost straight. Ductus bursae about twice than corpus bursae in length; medial expansion with numerous tentacles; ductus seminalis arising from beyond medial expansion. Corpus bursae with fine spicules around signum on inner surface; signum hexagonal with broad groove centrally.

Types. Holotype: male, Kenting Park 50 m, Pingtung Co., 29–31 VIII 1983 (JB Heppner). Paratype: 5 ♂ ♀, same locality, 29–31 VIII 1983 (JB Heppner and H Wang), gen. slide no. 4099, 4504/Park; 8 ♂ ♀, same locality, 1–5 IX 1983 (JB Heppner); 1 ♀, Fuyan 400 m, Bualin Co., 7 III 1990 (JB Heppner and H Wang); 1 ♂, Liukuei For Stn. 750 m, 29 IV–3 V 1989 (JB Heppner); 1 ♀, same locality, 16–23 III 1989 (JB Heppner); 1 ♀, Fushan For Stn. 650 m, Ilan Co., 4–11 IV 1990 (JB Heppner)–FSCA. 2 ♂, Shanpin For. Stn., Liukuei, Kaohsiung Co., 5–6 VII 1996 (KT Park and JS Lee) gen. slide no. 4276/Park; 1 ♂, Wulai 550 m, Taipei Co., 1–2 VII 1996 (KT Park and JS Lee); 1 (abd. missing), Ming-Chr 1,160 m, Ilan Co., 9–10 VII 1996 (KT Park and JS Lee)–CIS.

Distribution. Taiwan.

Remarks. The forewing venation is close to that of *Thubana* with M_1 free, but R_5 present, reaching to apex. Generally *Philharmonia* has M_2 and M_3 coincident, but this species has well developed M_2 . The male genital character is also well agreed to the genus *Philharmonia*. On the other hand, according to the male genitalia of *P. melona* Wu, it was probably misplaced to this genus.

Etymology. The species name is derived from Latin, adustus (= brown), corresponding to ground colour of the forewing.

DISCUSSION

The genus *Thubana* Walker is separable from *Torodora* Meyrick by the absence of R_5 , M_3 on a common stalk of CuA_1 and CuA_2 . The genus *Athymoris* is differentiated from *Torodora* by the absence of M_2 and opened cell in the forewing, but there are no considerable differences in the male genitalia. These two genera also need a further study with critical examination of the variation of the wing venations.

Gozmany (1978) erected a new genus *Cubitomoris*, separating from this genus by the difference of forewing venation, especially in CuA_1 and CuA_2 free, instead of stalked. However, those difference are considered not enough to separate them each other, because these infraspecific variations are often observed in many case of this family, such as *Lecithocera* and *Torodora*. The male genitalia of *aechmobola* Meyrick, type species of *Cubitomoris*, is much related to this genus. They also are similar to those of *Thubana*, but venation differs from the latter: Forewing with M_2 in *Thubana*. Thus, I propose to treat *Cubitomoris* Gozmany as a junior synonym of *Athymoris*.

On the other hand, the related genus *Haolaguna* Gozmany has also very similar venations, but the genital character is remarkably separable from *Athymoris*. The wing venation of this genus is also close to that of *Cynicostola* Meyrick, but the erect scales of the 2nd segment of labial palpus ventrally in *Cynicostola* can be a good separable character. A phylogenetic analysis with a further discussion to

define the taxonomic status of the above genera, *Thubana*, *Cynicostola*, *Halolaguna* and *Athymoris* are needed. *Athymoris paramecola* Wu, which was described from China, is erroneously placed in this genus by Wu, but it should be transferred to a genus of Lecithocerinae.

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REFERENCES

- Clarke, J.F.G. 1965. Catalogue of the type specimens of Microlepidoptera in the British Museum (Natural History) described by Edward Meyrick 5: 1–255. London.
- Gaede, M. 1937. Gelechiidae. In F. Bryk (ed). *Lepidopterorum Catalogus* 79: 1–630. s-Gravenhage.
- Gozmány, L. 1978. Lecithoceridae. In HG Amsel, F Gregor, H Reisser (eds). *Microlepidoptera Palaearctica*. Vol. 5. Wien: Verlag Georg Fromme.
- Meyrick, E. 1918, 1932. *Exotic. Microlepidoptera* [1918] 2: 102; [1932] 4: 203–205. Marlborough, Wilts.
- Meyrick, E. 1925. Family Gelechiidae. Lepidoptera Heterocera. In P Wytsman (ed). *Genera Insectorum* 184. Bruxelles.
- Park, K.T. 1999. Lecithoceridae of Taiwan (I). Subfamily Lecithocerinae: Genus *Homalxestis* Meyrick and *Lecithocera* Herrich-Shäffer. *Zoological Studies* 38: 238–256.
- Park, K.T. 2000a. Lecithoceridae of Taiwan (II). Subfamily Lecithocerinae: Genus *Lecithocera* and its allies. *Zoological Studies* 39(4): 360–374.
- Park, K.T. 2000b. Lecithoceridae of Taiwan (III). Subfamily Torodorinae: Genus *Torodora* Meyrick. *Trans. lepid. Soc. Japan* 51: 287–297.
- Park, K.T. 2000c. Lecithoceridae of Taiwan (IV). Subfamily Torodorinae: Genus *Deltoplastis* Meyrick. *Zoological Studies* 40(1), in preparation.
- Wu, C. 1994. The Lecithoceridae (Lepidoptera) of China with descriptions of new taxa. *Sinozoologia* 11: 123–154.
- Wu, C. 1997. Lepidoptera Lecithoceridae. Fauna Sinica, Insecta. Vol. 7. Beijing: Science Press, pp. 1–302.
- Wu, C. and K.T. Park. 1999. A taxonomic review of the Lecithoceridae (Lepidoptera) in Sri Lanka I. The subfamily Torodorinae: Genera *Deltoplastis*, *Hygroplasta*, and *Antiochtha*. *Ins. Koreana* 15: 1–22.
- Wu, C. and Liu. 1994. A study of Chinese *Torodora* Meyrick, 1894 and description of new species. *Sinozoologia* 11: 155–173.

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